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INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 30A-90 101	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 02/1 4603	International filing date (day/month/year) 19.12.2002	Priority date (day/month/year) 19.12.2002
International Patent Classification (IPC) or both national classification and IPC H04Q7/36		
Applicant TELEFONAKTIEBOLAGET LM ERICSSON (PUBL) et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 09.07.2004	Date of completion of this report 31.03.2005
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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 02/14603**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-37 as originally filed

Claims, Numbers

1-39 filed with telefax on 17.03.2005

Drawings, Sheets

1-28 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
- (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-39
	No: Claims	
Inventive step (IS)	Yes: Claims	1-39
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-39
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 02/14603

Re Item V

1. Reference is made to the following documents:

D1: US-A-6 130 886

D2: WO 95/17077

D3: WO 02/47357

2. **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

- 2.1 **Object:** The present application relates to a method (**claim 1**) for operating a first communications environment for which first communications resources are provided for communications according to a first communications standard type and are also used for communications according to a second communications standard type. Furthermore, it relates to a corresponding communications environment (**claim 19**), radio base station (**claim 37**) and computer program product (**claim 38**).
- 2.2 **Prior Art:** Document **D1** represents the closest state of the art.
The closest prior art describes a method for operating a communications environment wherein communications resources are subdivided between communications according to two different communication protocols. Communication resources are dynamically alternatively assigned for communications according to one or to the other communications standard type in dependence of communications to be performed according to each communications standard type.
- 2.3 **Problem:** Hence, the problem can be formulated as to dynamically optimize the use of the communication resources between different communication standard types .
- 2.4 **Invention:** The problem is solved by an adaptive control method characterized by using for communications according to a first communication standard type a first frame structure which includes at least one transmission gap; using said at least one transmission gap for communication according to a second communications standard type and controlling the use of said first communications resources by controlling the number and/or duration of said at least one transmission gap.

The requirement of Article 33 PCT are considered to be fulfilled because none the

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documents cited in the Search Report discloses or renders obvious the claimed solution of controlling the use of the first communications resources by controlling the number and/or duration of transmission gaps.

2.5 Advantages:

A communications capacity sharing exhibiting a dynamic behaviour and optimising the use of transmission resources can be obtained. In particular, communications resources used for communications according to a first communication standard type can dynamically be controlled based on actual communications capacity needs for communication according to a second communication standard type.

3. Remarks concerning formal defects in the international application:

- 3.1 **Reference signs** in parentheses have not been inserted in the claims to increase their intelligibility, Rule 6.2 (b) PCT.
- 3.2 **The cited documents D1, D2 and D3** have not been acknowledged and briefly discussed in the opening part of the description (see Rule 5.1 (a) (ii) PCT).
- 4.5 The opening part of the description have not been brought into agreement with newly filed independent claims (see Rule 5.1 (a) PCT).

CLAIMS

1. A method for operating a first communications environment for which first communications resources (TG) are provided for communications according to a first communications standard type, comprising the steps of:
- using the first communication resources for communications according to the first communications standard type,
 - using the first communications resources for communications according to a second communications standard type, and
 - controlling the use of the first communications resources as being used for communications according to the first communications standard type in dependence of communications to be performed according to the second communications standard type, characterized by
 - communicating according to the first communications standard type by using a first frame structure including at least one transmission gap (TG),
 - controlling the use of the first communication resources by controlling at least one of a number and duration of the at least one transmission gap (TG), and
 - using the at least one transmission gap (TG) for communications according to the second communications standard type.
2. The method according to claim 1, comprising the step of:
- controlling the use of the first communications resources (TG) for communications according to the first communications standard type in dependence of communications to be performed according to the first communications standard type.
3. The method according to claim 1 or 2, comprising the steps of:
- using second communications resources provided for communications according to the second communications standard type for communications according to the first communications standard type and
 - controlling the use of the second communications resources for communications according to the second communications standard type in dependence of communications to be performed according to the first communications standard type.

4. The method of claim 3, comprising the steps of:

- communicating according to the second communications standard type by using a second frame structure, and
- controlling the use of the second communications resource by controlling at least one of a number and a duration of at least a part of the second frame structure being used for communications according to the second communications standard type.

5. The method according to claim 3 or 4, comprising the step of:

- controlling the use of the second communications resources for communications according to the second communications standard type in dependence of communications to be performed according to the second communications standard type.

6. The method

- according to one of the preceding claims, wherein the first communications resources include a first frequency range, and/or
- according to one of the claims 3 to 5 the second communications resources include a second frequency range.

7. The method according to claim 6, wherein the first frequency range and the second frequency range overlap at least partially.

8. The method

- according to one of the preceding claims, comprising the step of:
 - controlling the use of the first communications resources for a geographical area for which both communications according to the first communications standard type and communications according to the second communications standard type are provided, and/or
- according to one of the claims 3 to 7, comprising the step of:
 - controlling the use of the second communications resources for a geographical area for which both communications according to the first communications standard type and communications according to the second communications standard type are provided.

9. The method

- according to one of the preceding claims, comprising the step of:
 - controlling the use of the first communications resources in dependence of at least one of a current communications traffic according to the second communications standard type, expected communications traffic according to the second communications standard type and available communications resources for communications according to the second communications standard type, and/or
- according to one of the claims 2 to 8, comprising the step of:
 - controlling the use of the first communications resources in dependence of at least one of a current communications traffic according to the first communications standard type, expected communications traffic according to the first communications standard type and available communications resources for communications according to the first communications standard type.

10. The method

- according to one of the claims 3 to 9, comprising the step of:
 - controlling the use of the second communications resources in dependence of at least one of a current communications traffic according to the first communications standard type, expected communications traffic according to the first communications standard type and available communications resources for communications according to the first communications standard type, and/or
- according to one of the claims 5 to 9, comprising the step of:
 - controlling the use of the second communications resources in dependence of at least one of a current communications traffic according to the second communications standard type, expected communications traffic according to the second communications standard type and available communications resources for communications according to the second communications standard type.

11. The method

- according to one of the preceding claims, comprising the step of:
 - providing the first communications resources as resources comprised by the first communications environment, which provides for communications according to the first communications standard type, and/or
- according to one of the claims 3 to 10, comprising the step of:
 - providing the first communications resources and second communications resources as resources comprised by the first communications environment, which

provides for both communications according to the first communications standard type and communications according to the second communications standard type.

12. The method according to one of the claims 3 to 11, comprising the steps of:

- providing the first communications resources as resources comprised by the first communications environment, which provides for communications according to the first communications standard type, and
- providing the second communications resources as resources comprised by a second communications environment, which provides for communications according to the second communications standard type.

13. The method according to one of the preceding claims, comprising the step of:

- communicating information indicating at least one of a current communications traffic according to the second communications standard type, expected communications traffic according to the second communications standard type and available communications resources for communications according to the second communications standard type to the first communications resources so as to control the use of the first communications resources.

14. The method according to one of the claims 3 to 13, comprising the step of:

- communicating information indicating at least one of a current communications traffic according to the first communications standard type, expected communications traffic according to the first communications standard type and available communications resources for communications according to the first communications standard type to the second communications resources so as to control the use of the second communications resources.

15. The method according to one of the preceding claims, comprising the step of:

- using the first communications resources for
- only communications according to the first communications standard type, or
- only communications according to the second communications standard type, or
- communications according to the first communications standard type and communications according to the second communications standard type.

16. The method according to one of the claims 3 to 15, comprising the step of:

- using the second communications resources for
- only communications according to the first communications standard type, or

- only communications according to the second communications standard type, or
- communications according to the first communications standard type and communications according to the second communications standard type.

17. The method according to one of the preceding claims, comprising the step of:

- controlling the use of the first communications resources such that communications according to the first communications standard type are prioritized in relation to communications according to the second communications standard type.

18. The method according to one of the claims 3 to 17, comprising the step of:

- controlling the use of the second communications resources such that communications according to the second communications standard type are prioritized in relation to communications according to the first communications standard type.

19. A communications environment, being adapted

- to utilize first communications resources (TG) for communications according to a first communications standard type for communications according to a second communications standard type, and
- to control the use of the first communications resources (TG) for communications according to the first communications standard type in dependence of communications to be performed according to the second communications standard type,

characterized in that

- the first communications resources comprise a first frame structure including at least one transmission gap (TG),
- the communications environment is adapted to control the use of the first communications resources by controlling at least one of a number and duration of the at least one transmission gap (TG), and
- the communications environment is adapted to control the use of the at least one transmission gap (TG) for communications according to the second communications standard type.

20. The communications environment according to claim 19, being adapted

- to control the use of the first communications resources (TG) for communications according to the first communications standard type in dependence of communications to be performed according to the first communications standard type.

21. The communications environment according to claim 19 or 20, being adapted
- to utilize second communications resources for communications according to the second communications standard type for communications according to the first communications standard type, and
- to control the use of the second communications resources for communications according to the second communications standard type in dependence of communications to be performed according to the first communications standard type.

22. The communications environment according to claim 21, wherein
- the second communications resources comprise a second frame structure for communication according to the second communications standard type, and
- the communications environment is adapted to control the use of the second communications resources by controlling at least one of a number and a duration of at least a part of the second frame structure being used for communications according to the second communications standard type.

23. The communications environment according to claim 21 or 22, being adapted
- to control the use of the second communications resources for communications according to the second communications standard type in dependence of communications to be performed according to the second communications standard type.

24. The communications environment,
- according to one of the claims 19 to 22, wherein the first communications resources include a first frequency range, and/or
- according to one of the claims 21 to 23, wherein the second communications resources include a second frequency range.

25. The communications environment according to claim 24, wherein
- the first frequency range and the second frequency range overlap at least partially.

26. The communications environment
- according to one of the claims 19 to 25, being adapted to control the use of the first communications resources for a geographical area for which both communications according to the first communications standard type and

communications according to the second communications standard type are provided, and/or

- according to one of the claims 21 to 25, being adapted to control the use of the second communications resources for a geographical area for which both communications according to the first communications standard type and communications according to the second communications standard type are provided.

27. The communications environment

- according to one of the claims 19 to 24, being adapted to control the use of the first communications resources in dependence of at least one of a current communications traffic according to the second communications standard type, expected communications traffic according to the second communications standard type and available communications resources for communications according to the second communications standard type, and/or

- according to one of the claims 21 to 26, being adapted to control the use of the first communications resources in dependence of at least one of a current communications traffic according to the first communications standard type, expected communications traffic according to the first communications standard type and available communications resources for communications according to the first communications standard type.

28. The communications environment

- according to one of the claims 21 to 27, being adapted to control the use of the second communications resources in dependence of at least one of a current communications traffic according to the first communications standard type, expected communications traffic according to the first communications standard type and available communications resources for communications according to the first communications standard type, and/or

- according to one of the claims 23 to 27, being adapted to control the use of the second communications resources in dependence of at least one of a current communications traffic according to the second communications standard type, expected communications traffic according to the second communications standard type and available communications resources for communications according to the second communications standard type.

29. The communications environment

- according to one of the claims 19 to 28, wherein the first communications resources are comprised by the first communications environment, which provides for communications according to the first communications standard type, and/or
- according to one of the claims 21 to 28, wherein the first communications resources and second communications resources are comprised by the first communications environment, which provides for both communications according to the first communications standard type and communications according to the second communications standard type.

30. The communications environment according to one of the claims 21 to 29, wherein

- the first communications resources are comprised by the first communications environment, which provides for communications according to the first communications standard type, and
- the second communications resources are comprised by a second communications environment, which provides for communications according to the second communications standard type.

31. The communications environment according to one of the claims 19 to 30, being adapted

- to communicate information indicating at least one of a current communications traffic according to the second communications standard type, expected communications traffic according to the second communications standard type and available communications resources for communications according to the second communications standard type to the first communications resources so as to control the use of the first communications resources.

32. The communications environment according to one of the claims 21 to 31, being adapted

- to communicate information indicating at least one of a current communications traffic according to the first communications standard type, expected communications traffic according to the first communications standard type and available communications resources for communications according to the first communications standard type to the second communications resources so as to control the use of the second communications resources.

33. The communications environment according to one of the claims 19 to 32, wherein the first communications resources are used for

- only communications according to the first communications standard type, or
- only communications according to the second communications standard type, or
- communications according to the first communications standard type and communications according to the second communications standard type.

34. The communications environment according to one of the claims 21 to 33, wherein the second communications resources are used for

- only communications according to the first communications standard type, or
- only communications according to the second communications standard type, or
- communications according to the first communications standard type and communications according to the second communications standard type.

35. The communications environment according to one of the claims 19 to 35, wherein

- the use of the first communications resources are controlled such that communications according to the first communications standard type are prioritized in relation to communications according to the second communications standard type.

36. The communications environment according to one of the claims 21 to 35, wherein

- the use of the second communications resources are controlled such that communications according to the second communications standard type are prioritized in relation to communications according to the first communications standard type.

37. A radio base station for a communications environment being adapted to be operated according to the steps of one of the claims 1 to 18.

38. A computer program product, comprising program code portions for carrying out the steps according to one of the claims 1 to 18.

39. The computer program product according to claim 40, being stored on a computer readable storage medium or in a computer readable storage device.

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